HOGGING DOWN CORN

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Durocs in the cornfield

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HOGGING DOWN CORN

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The practice of hogging down corn has grown rapidly for the past several years until it has become rather common. Its increasing popularity is due in a measure at least to the publicity it has received, the reports of its economy as compared with harvesting and feeding, and the advantages it offers. The saving in labor at a busy time of year brought about by hogging down makes an especially strong appeal to those who farm more land than they can care for alone and who find dependable help costly and difficult to secure.

From the standpoint of sanitation corn fields have an advantage over old hog lots or permanent pastures. It is advisable, however, to provide pigs with fresh pasture, either on fields in the rotation or on cultivated plots that have been seeded to forage especially for them. Such pastures, when the feeding place is changed from time to time, are likely to be about as clean and as free from parasite contamination as the corn field.

A further advantage of hogging down is that the amount of fertilizing constituents removed from the soil is reduced to the minimum and is less than that removed under the most careful management when the crop is harvested and fed and the manure returned. This advantage also applies when pigs are pastured on a field in the rotation while they are being fed the harvested corn, for then no more fertility is lost than if they were allowed to hog down the corn. It is merely transferred to another field and the corn field, being in the rotation, receives its share whenever it is in pasture.

FACTORS INFLUENCING TIME OF TURNING HOGS ON CORN

Prices favor early marketing.—One of the first problems confronted in the hogging down of corn is the time at which it is advisable to turn the hogs into the field. A study of market reports

shows that as the season advances in the fall the number of hogs received at market rapidly increases and that as a consequence there is usually a sharp decline in price, so that early marketed spring pigs ordinarily sell considerably higher than those marketed later. At this season, too, old corn is relatively high in price as a rule and often feeders must necessarily purchase enough to tide them over until the new crop is ready to use. These factors tend to encourage the use of green corn. On the other hand there are reasons for delaying the feeding of new corn until the crop is practically mature.

Yield of green corn.—Corn that is too green has a tendency to scour the pigs and reduce their resistance to disease. Furthermore the maximum yield will not be realized if the corn is not allowed to mature. A large share of the solids of the ear is deposited during the last few weeks of growth, so that the greener the corn at the time of consumption the greater the proportionate loss in yield. It will be seen from Table 1, which gives the yields of corn on an equivalent moisture basis at various stages of development, that to turn hogs on green corn would be to sacrifice a portion of the gain in live weight to be secured per acre.

TABLE 1.—Effect of Stage of Maturity on Yield of Corn, Ohio Experiment, 1921

Date of harvesting* 1921	Stage of maturity	Yield of moisture-free shelled corn per acre†	Yield of shelled corn per acre, 15.5 percent moisture	Relative yield with Sept. 23 as 100 percent
		Lb.	*Bu.*	*Pct.*
August 19	Shortly past roasting ear stage	1,463	30.9	39.8
August 26	"Glazing" stage, wrinkles forming on kernels	1,994	42.1	54.2
September 2	Fairly well dented; corn hardening	2,922	61.8	79.4
September 9	Close of ensilage stage; similar corn ensiled September 2 to 9	3,233	68.3	87.9
September 16	Ready to put in shock	3,526	74.5	95.9
September 23	Practically mature	3,678	77.7	100.0
October 21	Ready for husking; similar corn cribbed previous to October 21	3,760	79.5	102.2

*In 1921 corn matured at Wooster fully two weeks earlier than usual.
†Calculations made on a basis of 3,556 hills per acre.

The rapid increase in the dry matter of the ear during the last few weeks of growth is also shown by the figures presented in Table 2, which are taken from Bulletin 175, "Composition of Maize at Various Stages of Its Growth" by Jones and Huston of the Indiana Experiment Station. The results of the two experiments correspond very closely.

TABLE 2.—Effect of Stage of Maturity on Yield of Corn, Indiana Experiment, 1903

Date of harvesting	Stage of maturity	Weight of 10 ears: corn and cob	Pounds of dry matter in ears of 10,000 plants	Yield of shelled corn per acre, 15.5 percent moisture*	Relative dry matter in ears with Oct. 8 as 100 percent*
		Gm.	*Lb.*	*Bu.*	*Pct.*
September 10	Silks brown, pollen shed	3,005	2,267.5	28.1	43.7
September 24	Glazing stage, wrinkles forming on kernels but corn not hard	3,910	3,866.5	47.9	74.6
October 1	Ensilage stage	4,215	4,625.2	57.2	89.2
October 8	Ready to put in shock	4,200	5,185.7	64.2	100.0
November 12	Ready for husking	3,176	5,266.2	65.2	101.6

*Data in last two columns derived from those in the preceding column. Calculated on a basis of 7,112 plants per acre and 68 pounds of ear corn to the bushel.

Feeding value of solids in green and mature corn.—A natural question in connection with the yield of corn at different stages of maturity is the comparative value for feeding purposes of a pound of dry matter in green and in ripe corn. During the fall of 1921 an experiment was conducted to study the relative gains that would be produced from a given amount of solids in green, sappy corn and in fairly mature new corn. Samples of the corn fed each lot were taken at intervals during the experiment and the percentages of shelled corn determined. Determinations showed the moisture in the green corn to range from 38.6 to 42.5 percent, and that in the more nearly mature corn to range from 19.8 to 21.9 percent. Table 3 gives the results of the test.

TABLE 3.—Influence of the Moisture Content on the Feeding Value of Corn

	Lot 1* Mature ear corn 20 to 22 percent moisture	Lot 2* Green ear corn 39 to 42 percent moisture
Initial weight per pig	121.7	124.0
Final weight per pig	173.6	173.7
Total gain	207.5	199.0
Average daily gain	1.48	1.28
Feed consumed:		
Corn†	898.1	848.9
Tankage	42.0	46.8
Total	940.1	895.7
Daily feed per pig:		
Corn	6.41	5.44
Tankage	.30	.30
Total	6.71	5.74
Feed per 100 lb. gain:		
Corn	432.82	426.60
Tankage	20 24	23.52
Total	453.06	450.12

*Four pigs in each lot.

†On a shelled basis, reduced to 15.5 percent moisture. Lot 1 consumed 1,182 lb. of the mature ear corn and Lot 2, 1,594 lb. of the green ear corn.

TABLE 4.—Comparative Yields of Early and Standard Varieties of Corn

	Variety	1918	1919	1920	1921	1922	1923	1924	1925	8-year average
Early	Minnesota No. 13.....	51.39	45.88	54.91	64.51	56.89	47.00	62.72	80.95	58.03
Early	Pride of the North.....	44.80	55.31	47.35	66.01	55.82	52.25	63.95	87.07	59.07
Early	Golden Glow.....	53.66	58.93	60.02	61.73	54.99	47.22	62.40	84.86	60.48
Standard	Clarage.....	55.01	71.41	68.81	71.59	61.08	52.55	69.07	87.38	67.11
Rather late	Reid's Yellow Dent.....	55.77	69.61	64.34	66.90	43.47	37.99	63.18	78.43	59.96
Very late	Boone County White	42.99	62.32	48.30	52.54	37.07	38.05	42.23	69.02	49.06

Yields for 1918 to 1923, inclusive, given on a basis of weights April 1 and those for 1924 and 1925 on a basis of a moisture content of 15.5 percent. Data furnished by the Agronomy Department.

The findings of a single experiment, particularly when only a few pigs are used to the lot, do not warrant definite conclusions; but apparently there was little difference in the feeding value of the dry matter of the green corn and that of corn that was more nearly mature.

Early varieties yield low.—In order that the new corn may be sufficiently mature for hogging at an earlier date, growing a small acreage of an early variety is sometimes recommended. As will be seen in Table 4 an objection to this is that varieties not utilizing practically the entire growing season fail to yield as much as the standard varieties. Thus, what is gained by growing an early corn is partially or wholly offset by the loss in yield, and the consequent smaller increase in live weight per acre.

In 1922 Golden Glow, an early-maturing variety of corn for the latitude of Wooster, was compared with Clarage, a standard variety for the same latitude. The Golden Glow yielded 34.6 bushels to the acre and the Clarage 41 bushels. The results secured from hogging down the two crops are given in Table 5.

TABLE 5.—Comparison of an Early Corn (Golden Glow) and a Standard Variety (Clarage) for Hogging Down

	Lot 1 Early variety	Lot 2 Standard variety
From November 7, 1922 to.	Dec. 1	Dec. 1
Area hogged down, acre	0.5	0.5
Number of pigs per lot	6	6
Initial weight per pig	168.5	167.5
Final weight per pig	202.0	208.9
Total gain	201.0	248.5
Average daily gain	1.40	1.73
Feed:		
Corn (15.5 percent moisture)	934.0	1,114.3
Tankage	57.6	57.6
Total	991.6	1,171.9
Daily feed per pig:		
Corn	6.49	7.74
Tankage	.4	.4
Total	6.89	8.14
Feed per 100 lb. gain:		
Corn	464.68	448.43
Tankage	28.66	23.18
Total	493.34	471.61
Gain per bushel of corn	12.05	12.49
Value of gain per bushel, cost of tankage deducted*	$ .90	$ .96
Estimated yield per acre, bushels	34.6	41.0
Return per acre with cost of tankage deducted	$31.14	$39.36

*Gains $8.50 a 100 lb.; tankage $70 a ton.

There was a difference in gain of .44 pound per bushel of corn in favor of the standard variety, even if the gain in live weight from a given amount of corn had been the same for the two varieties the standard variety would have produced 80.4 pounds more gain to the acre. Except possibly when an earlier variety would permit

marketing the hogs at a materially higher price, the chances of securing maximum returns per acre apparently favor a variety of corn standard for the locality. In this connection the importance of planting corn as early as possible, when it is intended for hogging down, should be emphasized.

Sweet corn also yields low.—The advisability of planting sweet corn to hog down early in the season is sometimes asked. In an experiment conducted by the Agronomy Department in 1921, Stowell's Evergreen sweet corn produced 24.2 bushels of air-dried shelled corn to the acre as compared with a yield of 71.6 bushels of Clarage field corn. The sweet corn was planted at the same rate as the field corn. Perhaps a thicker seeding of sweet corn would have yielded more, but whether the yield would have approached that of the field corn, even then, is questionable.

PIGS BEST ADAPTED TO HOGGING DOWN CORN

Spring shotes with well developed frames but not extremely high in condition are well adapted to the hogging down of corn. March and April pigs that have received a limited amount of grain while on pasture during the summer should weigh from 80 to 140 pounds and be in excellent condition to give a good account of themselves when turned on standing corn. Lighter pigs ought also to do well on standing corn if a few older ones, to break down the stalks, were put with them. Such factors as the time of farrowing, their

TABLE 6.—Comparison of Pigs of Different Weights for Hogging Down Corn

	Lot 1 Light shotes Standing corn plus tankage	Lot 2 Heavy shotes Standing corn plus tankage
Length of feeding period, days	26	34
Area hogged down, acres	3	3
Number of pigs	37	18
Initial weight per pig	75.28	196.25
Final weight per pig	109.08	264.58
Total gain	1,250.5	1,230.0
Average daily gain	1.30	2.01
Feed:		
Corn (15.5 percent moisture)	5,510.4	6,033.7
Tankage	234.0	119.0
Total	5,744.4	6,152.7
Daily feed per pig:		
Corn	5.73	9.86
Tankage	.24	.19
Total	5.97	10.05
Feed per 100 lb. gain:		
Corn	440.66	490.54
Tankage	18.71	9.68
Total	459.37	500.22
Gain per bu. of corn received	12.71	11.42
Value of gains per bu.; cost of tankage deducted*	$ 1.00	$ .93

*Gains $8.50 per 100 lb.; tankage $70 a ton.

thrift, the quality and amount of forage, and the kind and quantity of concentrates received, all have an influence on the weight of pigs at the time the corn is ready to utilize. Ordinarily, while the pigs are on forage during the summer, limiting the concentrates fed to much less than 3 pounds daily for each 100 pounds of live weight does not pay, even tho the pigs are to be used later for hogging down corn.

Table 6 shows that as pigs on standing corn become heavier and fatter, they, like those fed under other conditions, require more feed for each pound of gain in live weight.

A summary of four hogging-down experiments with pigs under 100 pounds in weight at the beginning of the tests showed that an average of 417 pounds of corn and 20 pounds of tankage was consumed for each 100 pounds of gain produced. In 19 tests with pigs weighing between 100 and 150 pounds when turned on the corn an average of 432 pounds of corn and 16 pounds of tankage was required for each 100 pounds of gain. In 7 tests, in which pigs weighing more than 150 pounds at the beginning were used, the consumption of feed for each 100 pounds of gain averaged 517 pounds of corn and 17 pounds of tankage. The results of these experiments thus confirm those of the test in which a direct comparison with pigs of different weights, was made.

ACREAGE FOR A GIVEN NUMBER OF PIGS

A knowledge of the approximate amount of standing corn that pigs of different weights will consume under a contemplated system of management is required in order to know what acreage of corn to set aside for hogging down. Since considerable corn is wasted if hogs are left in the field after bad weather sets in, their period of harvesting will usually be limited to 60 days or less, depending on when the corn reaches sufficient maturity for hogging and when the inclement weather of winter begins.

As determined from the average consumption by pigs in a number of experiments in which the rations were used, Table 7 shows the estimated number of days that will be required for pigs of various weights to consume an acre of corn of the yields given, when they receive (1) standing corn only, (2) standing corn containing soybeans, (3) standing corn containing soybeans plus minerals, and (4) standing corn plus tankage.

Pigs getting a supplemental feed ate more corn daily a head than those getting nothing but corn. Feeding minerals along with

TABLE 7.—Time Required by Pigs to Harvest an Acre of Corn

	Standing corn only			Standing corn and soybeans			Standing corn and soybeans plus minerals			Standing corn plus tankage		
	Yield, bushels per acre											
	35	50	65	35	50	65	35	50	65	35	50	65
	Da.	*Da.*	*Da.*	*Da.*	*Da.*	*Da.*	*Da.*	*Da.*	*Da.*	*Da.*	*Da.*	*Da.*
10 shotes weighing 75—100 lb..	43	61	79	33	47	62	29	42	54	34	48	62
10 shotes weighing 100—150 lb..	29	41	53	25	36	47	23	33	43	25	36	47
10 shotes weighing 150—200 lb..	25	35	46	25	35	46	....	.....	....	19	27	35
20 shotes weighing 75—100 lb .	21	30	40	17	24	31	15	21	27	17	24	31
20 shotes weighing 100—150 lb..	14	20	27	13	18	24	12	16	21	13	18	23
20 shotes weighing 150—200 lb..	12	18	23	12	18	23	.....	.....	....	9	13	17
40 shotes weighing 75—100 lb..	11	15	20	8	12	15	7	10	14	8	12	16
40 shotes weighing 100—150 lb..	7	10	13	6	9	12	6	8	11	6	9	12
40 shotes weighing 150—200 lb..	6	9	11	6	9	11	.....	.....	....	5	7	9

corn and soybeans increased the consumption of corn. When tankage was fed, rape or soybeans in the corn or green feed in an adjoining field did not greatly change the time required for pigs to consume a given amount of corn. In fact, unless more total feed were eaten daily, the additional feed in the ration would necessitate the taking of a little longer time to utilize the same quantity of corn. If tankage is fed, ten pigs, weighing from 75 to 100 pounds each when placed in the field, will eat approximately a bushel of corn a day, they will clean up an acre of corn in as many days as it yields bushels.

SIZE OF FIELDS

Confining pigs to an area they will clean up in two to three weeks is sometimes recommended. Portions of a field can be fenced off temporarily by means of a low woven wire fence attached to well braced end posts and fastened to corn stalks or to stakes or line posts wherever necessary. Fencing off strips in this way, however, adds to the labor and expense and thus to a certain extent defeats the purpose of hogging down. With the possible exceptions of wet seasons and of the use of heavy hogs, which are inclined to waste considerable corn by knocking it down faster than it is consumed, the advisability of confining pigs to areas they will clean up in such a short time is questionable.

SUPPLEMENTAL FEEDS

The problems of supplementing corn are practically the same regardless of whether it is gathered and fed or harvested by the hogs. The beneficial effects of green feed for pigs running in corn are shown by the results of tests with 82-pound pigs, reported in

Nebraska Bulletin 159, in which access to alfalfa pasture in addition to standing corn increased the rate of growth from 1.25 to 1.57 pounds daily and the gain in live weight per bushel of corn from 10.7 to 12.6 pounds. Eleven experiments, at five different stations, in which standing corn alone was compared with standing corn and tankage, the tankage increased the rate of growth from 1 pound daily to 1.77 pounds and the gain for each bushel of corn consumed from 8.8 to 14.2 pounds. At $8.50 a 100 pounds the gain from each bushel of corn, when nothing else was fed, was worth 75 cents. After deducting the cost, at 3.5 cents a pound, of the 4.57 pounds of tankage consumed per bushel of corn, the gain from each bushel of corn, when tankage was fed, was worth $1.05. Thus at these prices the return from each bushel of corn was increased 30 cents by the use of tankage.

Fig. 2.—Hogs on corn and rape

Methods of supplementing standing corn.—Among the methods of providing pigs in the corn field a more nearly balanced ration than one of corn alone, the following may be listed: (1) growing some high-protein feed with the corn; (2) furnishing green feed either by seeding some such crop as rape or rye with the corn or by giving the pigs access to pasture in an adjoining field; and (3) feeding a high-protein concentrate like tankage, fish meal, a dairy by-product, linseed meal, or soybean oilmeal.

INFLUENCE OF SOYBEANS IN CORN UPON YIELDS

By planting soybeans, which are high in protein with corn it is possible to grow a mixture that is fairly well balanced so far as its protein content is concerned. Hence, it would seem that the combination should give much better results than corn alone and possibly do away with the necessity for purchasing high-priced protein concentrates. It is only within the last few years, however, that any definite information concerning the influence of growing soybeans in corn upon the amount and value of the feed produced per acre, has been available. Recently a number of investigators have been gathering data relative to the effect of an intercrop of soybeans upon the yields. Table 8 shows the yields per acre secured at different stations from corn alone and from corn and soybeans grown together, when the corn was checked or planted in hills.

TABLE 8.—Influence of Soybeans in Checked Corn on the Yields

	Years' work	Yield per acre					Reduction in yield of corn	Gain or loss (—) in total yield
		Corn only		Corn containing soybeans				
				Corn	Soybeans	Both		
	No.	*Bu.*	*Lb.*	*Bu.*	*Bu.*	*Lb.*	*Bu.*	*Lb.*
E. J. Kinney, Ky. Exp. Sta..	6	45.5	2,548	39.8	3.5	2,439	5.7	—109
Etheridge and Helm, Mo. Bul. 220.	5	42.2	2,362	35.2	3.9	2,205	7.0	—157
Etheridge and Helm, Mo. Bul. 220.....	5	38.2	2,138	30.3	4.3	1,953	7.9	—185
F. S. Wilkins, Ia. Exp. Sta.....	9	54.5	3,055	45.9	4.6	2,848	8.6	—207
R. W. Stark, Ill. Exp. Sta.....	2	58.0	3,248	51.3	5.4	3,197	6.7	— 51
Average.	.....	47.7	2,670	40.5	4.3	2,528	7.2	—142

At the Kentucky Station the corn was planted in hills 3½ feet apart. Soybeans of the Haberlandt variety were used each year. Four methods were tried: (1) dropping 3 to 4 beans in each hill of corn, (2) the same number between the hills of corn, (3) drilling the beans, and (4) planting the beans in alternate rows. The method of planting 3 or 4 beans in each hill of corn gave the largest total yield of corn and beans and the figures given in the table are for this method of seeding.

In Bulletin 220 of the Missouri Station two series of experiments, in which the corn was checked, are reported. Wilson soybeans were used in one series and Morse in the other. The corn rows were 44 inches apart, with two and three soybean plants and

two and three stalks of corn to the hill as the rates of planting. Two plants of each to the hill gave the best results and the figures presented are for this rate.

Manchu soybeans were used in the Iowa experiments. The stands of corn secured averaged 2.61 plants to the hill and the beans 3.38 plants for every 42 inches. At the Illinois Station the Ebony, Hongkong, and Ito San varieties of soybeans were tried each year. The yields given are the averages for the three varieties. Four years' work at the Illinois Station in which the yields of the beans were not determined gave an average of 57.1 bushels of corn to the acre when it was grown alone and 51.3 bushels to the acre when soybeans were grown with it.

Table 9 gives the results of experiments in which the corn was drilled rather than checked.

TABLE 9.—Influence of Soybeans in Drilled Corn on the Yields

	Years' work	Yield per acre					Reduction in yield of corn	Gain or loss (—) in total yield
		Corn only		Corn containing soybeans				
				Corn	Soybeans	Both		
		Bu.	*Lb.*	*Bu.*	*Bu.*	*Lb.*	*Bu.*	*Lb.*
F. S. Wilkins, Ia. Exp. Station ...	3	52.5	2,939	47.7	5.5	2,976	4.8	37
R. W. Stark, Ill. Exp. Station	2	53.9	3,018	47.0	6.3	3,010	6.9	−8
Etheridge and Helm, Mo. Bul. 220	3	45.1	2,526	41.1	6.1	2,666	4.0	140
J. B. Park, Ohio State University	7	53.4	2,989	45.0	7.1	2,948	8.3	−41
Agronomy Dept. Ohio Exp. Sta..	1	65.8	3 687	56.8	8.2	3,673	9.0	−14
Average.	.....	52.5	2,940	45.8	6.5	2,954	6.7	14

Manchu soybeans drilled 7 to 14 inches apart were used in the Iowa tests. Counts showed an actual stand of 2.87 stalks of corn and 3.48 soybeans plants for every 42 inches of row. In the Illinois experiments the same three varieties of soybeans that were seeded with the checked corn were used with the drilled corn and the data given are the averages for the three. On upland soil in the Missouri experiment two stalks of corn every 44 inches gave a larger average yield than three stalks when the corn was drilled, and two soybean plants at the same distance gave a larger total yield for the corn-soybean combination than three soybean plants. The data presented are for the rates giving the highest total yield of corn and beans.

The data from the Department of Farm Crops of Ohio State University are for a medium stand of both corn and beans in which there were a stalk of corn every 12 to 14 inches and a soybean plant

every 4 to 5 inches. Peking soybeans were used the first two years, Virginia the third, and Manchu from the fourth to seventh, inclusive. In the trial made by the Agronomy Department of the Ohio Experiment Station Manchu soybeans were used.

The presence of the soybeans slightly reduced the total yield when the corn was checked and slightly increased the total yield in two cases out of five in which the corn was drilled. While the differences are slight soybeans apparently gave better results with drilled corn than with checked or hilled corn.

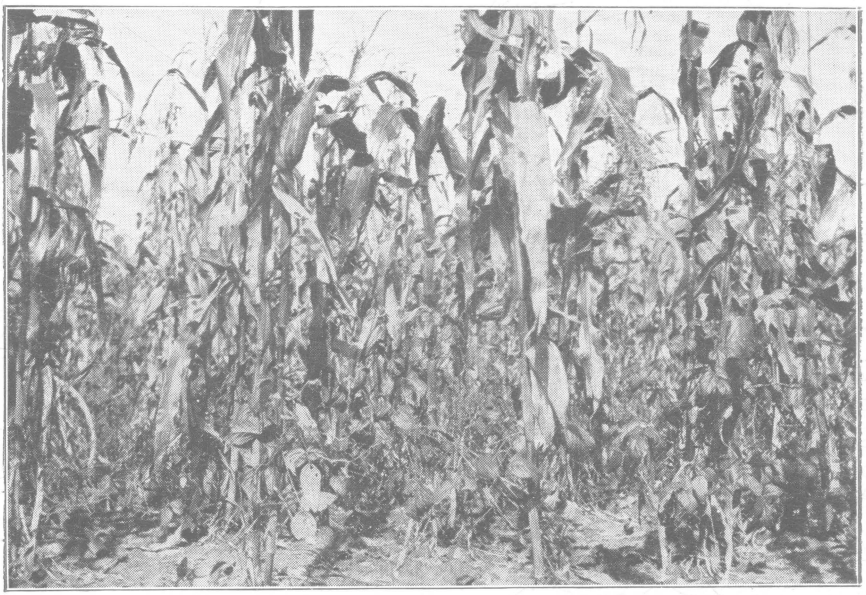

Fig. 3.—Soybeans seeded with corn for hogging down

If the differences are significant, why this should be true can only be surmised. It may be that the drilled corn was not ordinarily kept as clean as the hilled corn, and that the soybeans gave a greater increase in total yield, or brought about a smaller reduction in yield, because they utilized space that otherwise, in some instances at least, would have been occupied by weeds. Possibly the spacing of the plants when drilled resulted in less competition between the crops and a more favorable condition for their growth. Or, perhaps, somewhat less than an optimum stand of corn for maximum yields was usually secured when the corn was drilled. This seems plausible from the fact that, with one exception, the reduction in the yield of the drilled corn brought about by the presence of

the beans was directly proportional to the yields of corn secured. This was also true with reference to the gain or loss in total yield. That is, the greatest gain in total yield due to the presence of the beans was in connection with the lowest yield of corn.

Seasonal variations doubtless affect the relative yields of corn and of corn and soybeans. Etheridge and Helm[1] state that, when corn is injured by drouth, soybeans provide no important compensation for the loss in corn, that, indeed, their growth actually contributes to this very loss. Kinney and Roberts[2] explain the reduction in the yield of corn as "due almost entirely to the beans using water needed by the corn."

To secure information on the assertion that when corn and soybeans are grown together on bottom land the corn is not affected by the beans because fertility is abundant for both, Etheridge and Helm[1] planted soybeans with corn on rich, moist, creek-bottom land. The corn alone planted at the rate of two stalks to the hill yielded 81.5 bushels to the acre. Corn seeded at the same rate but containing two soybean plants to the hill yielded 70.9 bushels to the acre and the soybeans yielded 2.4 bushels. With three stalks to the hill the corn made 85.8 bushels to the acre when seeded alone and 71 bushels when containing two soybean plants to the hill. The beans in this case yielded 2.9 bushels. The soybeans produced a luxuriant growth of vines which affected the yield of corn, but were so shaded by the rank growth that their seed production was small.

In the experiments reported in Tables 10, 11, and 13 no attempt was made to determine the yields of the soybeans. Because of differences in previous treatment the plots containing corn alone and those containing corn and soybeans were not always comparable. On comparable plots the soybeans reduced the yield of drilled corn 5.72 bushels to the acre in 1921 and 4.69 bushels in 1922.

An exceptionally favorable season for corn in 1925 and a thick stand in the experiment for that year reported in Table 15 apparently had the same effect on yield as the bottom land used for the Missouri experiment referred to above. The soybeans produced a fair growth of vines but, presumably because they were so shaded by the corn, the production of beans was very low. The two plots of corn alone averaged 66.1 bushels to the acre. Mixtures of corn and soybeans on an intervening and an adjoining plot, similarly treated, averaged 54.8 bushels of corn and 1.86 bushels of soybeans to the acre.

[1]Missouri Agricultural Experiment Station, Bulletin 220.
[2]Kentucky Agricultural Experiment Station, Bulletin 232.

In the other 1925 experiment, reported in Table 16, the corn was planted in hills, but pigeons took so much of the seed before they were discovered that a poor stand was secured. The thin corn and a favorable season resulted in a luxuriant growth of the soybean vines and a high yield of beans. The corn alone averaged 46.22 bushels to the acre, while the combined crop produced 41.99 bushels of corn and 9.43 bushels of beans, or a total of 330 pounds more feed to the acre, differing in this respect from the experiments reported in Table 8 in all of which the soybeans were responsible for a loss in total yield.

RESULTS OF EXPERIMENTS WITH DIFFERENT SUPPLEMENTS

THE 1920 EXPERIMENT

For the hogging-down experiment in 1920 Clarage corn was drilled in five ½-acre plots. Just after the corn was planted, Hamilton soybeans, which are brown in color were seeded in the rows of corn in two of the plots by means of a hand planter. Rape was broadcasted in a third plot at the time of the last cultivation of the corn.

Method of estimating yields of corn.—With the exception noted later, the yields of corn on the plots hogged down in this and the other experiments reported were estimated by gathering and weighing the corn from two representative rows, one about a third of the disance from one side and the other about the same distance from the opposite side, determining the percentage of moisture-free shelled corn in a typical sample of this, and from these data calculating the yields of shelled corn on a moisture basis of 15.5 percent.

Manner of feeding tankage.—Likewise, with one exception, whenever tankage was used it was hand fed dry at the rate of .4 pound daily a head to the pigs having no other supplement, and at the rate of .3 pound to those having rape or soybeans. The exception was the experiment reported in Table 15 in which the allowance was increased to .5 and .4 pound daily a head, respectively. In feeding these larger amounts it was found necessary at first to omit the tankage on some days in order to get the pigs to clean up what had already been given them.

If tankage is self-fed to pigs on standing corn, a careful watch should be kept to see that they take no more than is needed for the most economical gains. For when tankage is easily accessible in a self-feeder the pigs sometimes eat more than is necessary, particularly after the corn becomes somewhat thin and more difficult to get.

To compare harvesting and feeding with hogging down, the corn, including the fodder, was removed from one plot and, in order that they might be under similar conditions, a group of pigs similar to those on the standing corn was placed on the plot and fed the husked corn that was taken from it.

Table 10 shows the plan of feeding followed in the experiment and gives the results secured.

TABLE 10.—Comparison of Supplements to Standing Corn, 1920

	Lot 1 Harvested corn	Lot 2 Standing corn	Lot 3 Standing corn containing soybeans	Lot 4 Standing corn containing soybeans	Lot 5 Standing corn containing rape	Lot 6 Standing corn containing rape
Supplement fed	Tankage	Tankage	None	Tankage	None	Tankage
From October 15, 1920 to	Nov. 19	Nov. 19	Nov. 18	Nov. 13	Nov. 18	Nov. 15
Area hogged down, acre	.....	.5	.5	.5	.25	.25
Number of pigs per lot	6	6	6	6	3	3
Initial weight per pig	146.33	145.83	146.33	146.17	147.17	148.0
Final weight per pig	210.92	208.33	181.67	192.75	198.83	210.33
Total gain	387.5	375.0	212.0	279.5	155.0	187.0
Average daily gain	**1.85**	**1.79**	**1.04**	**1.61**	**1.52**	**2.01**
Feed:						
Corn (15.5 pct. moisture)	1,741.3	1,804.4	1,408.38	1,262.42	909.22	883.01
Tankage	84	84	.....	52.2	.....	27.9
Corn and tankage	1,825.3	1,888.4	1,408.38	1,314.62	909.22	910.91
Daily feed per pig:						
Corn	8.29	8.59	6.90	7.26	8.91	9 49
Tankage	.40	.40	.....	.30	.....	.30
Corn and tankage	8.69	8.99	6.90	7.56	8.91	9.79
Feed per 100 lb. gain:						
Corn	449.37	481.17	664.33	451.67	586.59	472.20
Tankage	21.68	22.40	.....	18.68	.....	14.92
Corn and tankage	471.05	503.57	664.33	470.35	586.59	487.12
Gain per bu. of corn received	**12.46**	**11.64**	**8.43**	**12.40**	**9.55**	**11.86**
Value of gains per bu.; cost of tankage deducted	$ .96	$ .90	$ .72	$ .97	$ .81	$ .95
Returns per acre; cost of tankage deducted*	$50.65	$47.14	$32.82	$44.55	$41.33	$48.18

Gains $8.50 per 100 lb.; tankage $70 a ton.
*Based on corn yields given in Table 9 and an assumed reduction of 3 percent when containing rape.

THE 1921 EXPERIMENT

Six ½-acre plots of corn were used for the experiment in 1921. The corn was drilled, as in 1920, and three plots were seeded to Ebony soybeans about ten days after the corn was planted and in the same manner as before. At the time of the last cultivation of the corn, rape was seeded in a fourth plot as well as in one of those containing soybeans. The pigs used were Duroc Jerseys, which were thrifty but in rather thin condition. With the exception of one in each lot from the Station herd they were purchased from two herds in the neighborhood of Wooster. In order to accustom the pigs to the taste of the beans before they were placed on the experiment they were fed soybeans, including the vines, for about ten days previous to the beginning of the test.

The plan of feeding is perhaps shown more clearly in Table 11 than it can be described. The pigs receiving the harvested corn were kept on one-half acre of rape pasture which furnished plenty of green feed during the time of the experiment. Tankage was fed to all of the lots except one on standing corn containing soybeans.

TABLE 11.—Comparison of Supplements to Standing Corn, 1921

	Lot 1 Standing corn containing soybeans	Lot 2 Standing corn containing soybeans	Lot 3 Standing corn containing soybeans and rape	Lot 4 Standing corn containing rape	Lot 5 Standing corn	Lot 6 Harvested new corn fed on rape pasture
Supplement fed	None	Tankage	Tankage	Tankage	Tankage	Tankage
From Sept. 27, 1921 to	Nov. 5	Nov. 2	Nov. 9	Nov. 9	Nov. 7	Nov. 4
Area hogged down, acre	.5	.5	.5	.5	.5	.5
Number of pigs per lot	6	6	6	6	6	6
Initial weight per pig	128.00	127.92	127.75	126.67	127.33	127.83
Final weight per pig	173.50	199.83	213.92	211.25	201.75	205.25
Total gain	273.00	431.5	517.00	507 50	446.5	464 5
Average daily gain	1.17	2.00	2.00	1.97	1.82	2.04
Feed:						
Corn (15.5 pct. moisture)	1,613.71	1,726.03	1,989.91	2,035.76	1,830.06	1,640.98
Tankage	.....	64.8	77.4	77.4	98.4	68.4
Corn and tankage	1,613.71	1,790.83	2,067.31	2,113.16	1,928.46	1,709.38
Daily feed per pig:						
Corn	6.47	7.99	7.71	7.89	7.44	7.20
Tankage	.....	.30	.3	.3	.4	.3
Corn and tankage	6.47	8.29	8.01	8.19	7.84	7.50
Feed per 100 lb. gain:						
Corn	591.10	400.00	384.90	401.14	409.87	353.28
Tankage	.....	15.02	14.98	15.25	22.04	14.73
Corn and tankage	591.10	415.02	399.87	416.39	431.91	368.01
Gain per bu. of corn received	9.47	14.00	14.55	13.96	13.66	15.85
Value of gain per bu., cost of tankage deducted	$ .81	$ 1.12	$ 1.16	$ 1.11	$ 1.06	$ 1.27
Returns per acre; cost of tankage deducted*	$36.88	$51.13	$51.32	$56.63	$55.44	$66.45

Gains $8.50 per 100 lb.; tankage $70 a ton.
*Based on corn yields given in Table 9 and an assumed reduction of 3 percent when containing rape.

VALUE OF SOYBEANS IN CORN AS AFFECTED BY STAGE OF MATURITY

Tests with soybean pasture showed the forage, while it lasted, to approach alfalfa, clover, and rape in value. The two preceding hogging-down experiments and tests with the soybeans as a protein supplement to corn, indicated the foliage to be much more palatable than the beans themselves. From this it was thought that, perhaps, a late maturing variety of soybeans in corn for hogging down might prove more valuable than an earlier variety the foliage of which would largely be shed by the time the corn was ready to utilize. Accordingly, an experiment was planned to compare (1) a variety of soybeans maturing earlier than the corn, (2) a variety maturing later than the corn, and (3) soybeans seeded in the corn at the last cultivation.

Because of extreme drouth the soybeans that were seeded at the last cultivation of the corn made a very scanty growth. In some places no beans grew. Consequently this plot consisted virtually of corn alone. The corn also suffered severely from the dry weather and yielded low, especially on the two plots containing the soybeans that were seeded at the same time as the corn. No attempt was made to determine the yield of the beans but the Hamilton or late variety produced a much more luxuriant growth of foliage and perhaps more beans than the Manchu or earlier variety.

The pigs used for the experiment were bought from farmers in the vicinity and were of Chester White, Duroc Jersey, Poland China, and Spotted Poland China breeding. In allotting them they were divided as equally as possible with reference to type, breed, sex, weight, condition, and thriftiness of appearance. Table 12 shows the number of pigs in each lot and the plan of feeding and gives the results secured.

TABLE 12.—Effect of Stage of Maturity on the Value of Soybeans in Corn for Hogging Down

	Lot 1 Standing corn containing soybeans, seeded at last cultivation	Lot 2 Standing corn containing late soybeans	Lot 3 Standing corn containing early soybeans	Lot 4 Standing corn	Lot 5 Harvested new corn fed on rape pasture
Supplement fed	None	None	None	Tankage	Tankage
Variety of soybeans used	Medium Green	Hamilton	Manchu		
From Oct. 2, 1922 to	Nov. 6	Oct. 24	Oct. 20	Oct. 25	Oct. 24
Area hogged down, acre	1	1	1	1	.....
Number of pigs per lot	10	9	9	12	10
Initial weight per pig	111.40	108.60	115.67	106.96	115.20
Final weight per pig	144.80	144.06	136.11	148.17	155.75
Total gain	334.0	319.0	184.0	494.5	405.5
Average daily gain	.95	1.61	1.14	1.79	1.84
Feed:					
Corn (15.5 % moisture)	1,617.47	924.90	932.34	1,749.05	1,199.51
Tankage	.....	.....	.....	110.40	66.0
Daily feed per pig:					
Corn	4.62	4.67	5.75	6.34	5.45
Tankage	.....	.....	.....	.40	.30
Feed per 100 lb. gain:					
Corn	484.27	289.94	506.71	353.70	295.81
Tankage	.....	.....	.....	22.33	16.28
Gain per bu. of corn received	11.56	19.31	11.05	15.83	18.93
Value of gain per bu., cost of tankage deducted	$ .98	$1.64	$ .94	$1.22	$1.50

Gains $8.50 per 100 lb.; tankage $70 a ton.

The Manchu soybeans were so nearly mature that most of the leaves had dropped off when the pigs were turned into the corn; the Hamilton soybeans, on the other hand, still carried a large amount of foliage. While the pigs on the corn containing the Hamilton

soybeans made even greater gains per bushel of corn consumed than those getting tankage, those on the corn containing the Manchu soybeans gained much less. Further tests are needed to verify these results, but apparently the green feed furnished by the soybean leaves had a much higher nutritive value than the beans themselves. In this connection it should be remembered that soybeans do not furnish green feed late into the fall because most of the leaves drop off soon after the first killing frost, consequently the period hogs are in the field with reference to the time freezing weather begins may have a marked effect on the worth of an intercrop of soybeans for supplementing standing corn.

THE 1922 EXPERIMENT

At the close of the test reported in Table 12 the pigs were re-allotted and used in a second experiment, the plan and results of which are given in Table 13. The corn for the second test was grown on plots previously used for forage purposes and produced a fair yield in spite of the drouth. The corn was drilled. One of the plots hogged down contained no intercrop; two contained Elton soybeans, seeded with a hand planter just after the corn was planted; two, rape, broadcasted at the time of the last cultivation; and one, both soybeans and rape. With the exception of one group on corn containing soybeans and one on corn containing rape all of the pigs were fed tankage.

Since they will not be discussed later, it may be worth while in passing to call attention to the results from two of the rations tried—one standing corn and rape, the other standing corn, soybeans and rape with tankage added. Tankage along with corn and rape increased the rate of gain from 1.01 to 1.58 pounds daily a head and the gain in live weight for each bushel of corn consumed from 8.11 to 12.56 pounds. The tankage fed amounted to 2.4 pounds for each bushel of corn. A lame pig in the corn-and-rape lot doubtless made their showing somewhat poorer than it would have been otherwise. Until taken out shortly before the close of the trial it gained .67 pound daily as compared with an average of 1.07 pounds daily for the other pigs in the lot during the same time, In the 1920 experiment tankage with corn and rape increased the rate of gain from 1.52 to 2.01 pounds daily and the gain in live weight for each bushel of corn consumed from 8.91 to 9.41 pounds. An average of 1.77 pounds of tankage for each bushel of corn was fed, The results of the two trials indicate the advisability of feeding a protein concentrate to pigs on standing corn and rape.

TABLE 13.—Comparison of Supplements to Standing Corn, 1922

	Lot 1 Standing corn containing soybeans and rape	Lot 2 Standing corn containing soybeans	Lot 3 Standing corn containing soybeans	Lot 4 Standing corn	Lot 5 Standing corn containing rape	Lot 6 Standing corn containing rape	Lot 7 Harvested new corn
Supplement fed☞	Tankage	Tankage	None	Tankage	Tankage	None	Tankage
From Nov. 7, 1922 to	Dec. 4	Dec. 3	Dec. 1	Dec. 1	Dec. 3	Dec. 9	Dec. 1
Area hogged down, acre	.5	.5	.5	.5	.5	.5	.....
Number of pigs per lot	6	6	6	6	6	6	6
Initial weight per pig	167.58	168.68	167.92	167.50	167.25	168.08	169.00
Final weight per pig	216.25	207.5	192.33	208.92	208.33	211.00	216.42
Total gain	292.0	233.0	146.5	248.5	246.5	191.5	284.5
Average daily gain	1.80	1.50	1.02	1.73	1.58	1.01	1.98
Feed:							
Corn (15.5 pct. moisture)	1,288.94	1,007.96	957.43	1,114.34	1,099.35	1,322.91	1,129.17
Tankage	48.60	46.80	.....	57.60	46.80	.....	57.60
Corn and tankage	1,337.54	1,054.76	957.43	1,171.94	1,146.15	1,322.91	1,186.77
Daily feed per pig:							
Corn	7.96	6.46	6.65	7.74	7.05	6.96	7.84
Tankage	.30	.30	.....	.40	.30	.....	.40
Corn and tankage	8.26	6.76	6.65	8.14	7.35	6.96	8.24
Feed per 100 lb. gain:							
Corn	441.42	431.68	653.53	448.43	445.98	690.81	396.89
Tankage	16.64	20.04	.....	23.18	18.99	.....	20.25
Corn and tankage	458.06	451.72	653.53	471.61	464.97	690.81	417.14
Gain per bu. of corn received	12.69	12.98	8.57	12.49	12.56	8.11	14.11
Value of gains per bu., cost of tankage deducted	$ 1.00	$ 1.01	$ .73	$ .96	$ .98	$ .69	$ 1.10
Returns per acre; cost of tankage deducted*	$44.42	$46.36	$33.36	$50.41	$50.11	$35.09	$57.71

Gains $8.50 per 100 lb.; tankage $70 a ton.

*Based on corn yields given in Table 9 and an assumed reduction of 3 percent when containing rape.

In each of the experiments reported in Tables 11 and 13 both soybeans and rape were seeded in one plot of corn. The pigs on these plots were given tankage in both instances. In 1921, Table 11, the rate of growth for the pigs getting corn, soybeans, rape, and tankage was practically the same as for those getting the same feed with the rape omitted. The rape, however, resulted in a half pound more gain per bushel of corn consumed. In 1922, Table 13, the pigs getting corn, soybeans, rape, and tankage gained .3 pound more daily a head than those on the same feeds without the rape; but they lacked .3 pound of making as much gain per bushel of corn consumed. In both experiments the combination of corn, soybeans, and rape was grown on more productive plots than was the mixture of corn and soybeans. Further work is needed to determine which of the two combinations is likely to produce the greater gain in live weight per acre when they are hogged down.

AVERAGE OF THREE YEARS' RESULTS

The presenting of each year's work separately is desirable, for certain seasonal variations may favor a given combination. For determining the relative worth of different combinations, however,

a summary of two or more experiments is of much greater value than the results of a single test. Table 14 presents the three-year average results secured from standing corn and soybeans, with and without tankage; from standing corn, rape, and tankage; and from standing corn and tankage.

TABLE 14.—Summary of Experiments Comparing Tankage, Soybeans With and Without Tankage, and Rape With Tankage for Supplementing Standing Corn

	Standing corn containing soybeans	Standing corn containing soybeans	Standing corn	Standing corn containing rape
Supplement fed☞	None	Tankage	Tankage	Tankage
Number of trials	3	3	3	3
Number of pigs	18	18	18	15
Area hogged down, acres	1.5	1.5	1.5	1.25
Initial weight per pig	147.4	147.6	146.9	147.17
Final weight per pig	182.5	200.03	206.33	209.9
Total gain	631.5	944.5	1,070.0	941.0
Average daily gain	1.09	1.73	1.78	1.86
Feed:				
Corn	3,979.53	3,996.40	4,748.80	4,018.13
Tankage	.....	163.80	240.00	152.10
Daily feed per pig:				
Corn	6.84	7.32	7.91	7.93
Tankage	.....	.30	.40	.30
Feed per 100 lb. gain:				
Corn	630.17	423.12	443.81	427.01
Tankage	.....	17.34	22.43	16.16
Gain per bu. of corn received	8.89	13.23	12.62	13.11
Value of gains per bu., cost of tankage deducted	$ .76	$ 1.04	$ .97	$ 1.04
Returns per acre; cost of tankage deducted*	$34.59	$47.84	$51.11	$52.99

Gains $8.50 per 100 lb.; tankage $70 a ton.
*Based on corn yields given in Table 9 and an assumed reduction of 3 percent when containing rape.

Standing corn and soybeans were much less effective than standing corn and tankage, both with respect to the rapidity of growth and to the gains produced per bushel of corn received. On a basis of the yields given in Table 9 and the average results in Table 14, standing corn with tankage would have produced 662.4 pounds of gain in live weight per acre. The tankage consumed with the corn would have amounted to 148.6 pounds. With the gains in live weight valued at $8.50 a 100 pounds and with the cost of the tankage at $70 a ton deducted, the return per acre would have amounted to $51.11. Likewise, according to the two sets of data, an acre of corn and soybeans would have produced 406.9 pounds of gain in live weight and have resulted in a gross return of $34.59. Feeding tankage with the corn and soybeans would have produced 606.2 pounds of gain in live weight per acre and have resulted in a gross return of $47.84, after deducting the cost of the 105.1 pounds of tankage required.

Altho the combination of standing corn, rape, and tankage produced slightly more rapid gains on the average than that of standing corn, soybeans, and tankage, it failed to produce quite as much gain in live weight per bushel of corn consumed. It hardly seems likely that rape would not ordinarily reduce the yield of corn more than .5 bushel to the acre, which was the average for 1920 and 1922 when crops of corn and of corn containing rape, seeded at the last cultivation, were grown on what were regarded as comparable plots. The yields in these experiments as well as other available evidence, however, indicate that the yield of corn is reduced by rape as a companion crop less than by soybeans. On a basis of the results in Table 14 corn containing rape would need to yield very little more (.9 percent) than corn containing soybeans in order to produce as much gain in live weight.

Possibly rape seeded at the last cultivation does not compete with the corn for moisture to as great an extent as do soybeans seeded at the same time as the corn. In seasons of insufficient rainfall the rape produces little or no growth. Whenever there is an ample supply of moisture the rape makes considerable growth and increases the value of the crop for hogging down.

MINERALS WITH CORN AND SOYBEANS

In the 1925 experiment, reported in Table 15, the corn was drilled. Three of the plots contained Elton soybeans which were seeded with the corn by means of an attachment to the planter. For harvesting and feeding, corn of the same variety (Clarage) was planted at the same time, but was grown in a different field. There were 5 thin but large framed and exceptionally thrifty, cross-bred Duroc-Tamworth pigs from the Station herd and 3 somewhat smaller pure-bred Poland China pigs to the lot. For the purpose of accustoming the pigs to the taste of the beans, both ground soybeans and whole soybean plants were added to their ration about ten days before the beginning of the experiment. During the trial the pigs fed harvested corn were kept on a half acre plot of mixed rape and sweet clover pasture which furnished an abundance of both kinds of forage.

An attempt was made to estimate the yield of soybeans on each plot by gathering, drying, and hulling the beans from two representative rows. As previously mentioned a thick stand of corn was secured and the season was a particularly favorable one for its production. The soybeans made a reasonable growth of vines but,

possibly because they were so shaded by the corn, yielded only a small quantity of beans. Nevertheless, they had a marked effect in reducing the yield of the corn.

TABLE 15.—Soybeans in the Corn Compared With Tankage for Supplementing Standing Corn and Minerals*

	Lot 1 Standing corn containing soybeans	Lot 2 Standing corn	Lot 3 Standing corn containing soybeans	Lot 4 Standing corn	Lot 5 Standing corn containing soybeans	Lot 6 Harvested new corn, pigs on rape and sweet clover pasture
Supplements fed	Tankage Minerals	Tankage Minerals	Minerals	Minerals		Tankage Minerals
From Sept. 29, 1925 to	Nov. 4	Nov. 14	Nov. 7	Nov. 14	Nov. 3	Nov. 14
Area hogged down, acre	1	1	1	1	1	.....
Number of pigs per lot	8	8	8	8	8	8
Initial weight per pig	98.44	98.67	98.44	98.48	98.60	98.23
Final weight per pig	184.94	195.62	182.69	182.12	167.75	214.50
Total gain	692.00	775.67	674.00	669.17	553.17	930.17
Average daily gain	**2.40**	**2.11**	**2.16**	**1.82**	**1.98**	**2.53**
Feed:						
Corn (15 5 pct. moisture)	3,097.60	3,631.36	2,982.71	3,713.83	2,863.97	3,377.63
Tankage	89.60	152.00	.....	.....	.....	136.00
Soybeans	86.60	.....	129.80	.....	101.20	.....
Mineral mixture	10.00	14.80	20.00	24.50	.....	5.40
Salt	3.00	2.00	1.70	2.80	2.00	3.80
Total	3,286.80	3,800.16	3,134.21	3,741.13	2,967.17	3,522.83
Daily feed per pig:						
Corn	10.76	9.87	9.56	10.09	10.23	9.18
Tankage	.31	.41	.....	.....	.....	.37
Soybeans	.30	.....	.42	.....	.36	.....
Mineral mixture	.03	.04	.06	.07	.....	.01
Salt	.01	.01	.01	.01	.01	.01
Total	11.41	10.33	10.05	10.17	10.60	9.57
Feed per 100 lb. gain:						
Corn	447.63	468.16	442.54	554.99	517.74	363.12
Tankage	12.95	19.59	.....	.....	.....	14.62
Soybeans	12.51	.....	19.26	.....	18.30	.....
Mineral mixture	1.45	1.91	2.97	3.66	.....	.58
Salt	.43	.26	.25	.42	.36	.41
Total	474.97	489.92	465.02	559.07	536.40	378.73
Gain per bu. of corn received	**12.51**	**11.96**	**12.65**	**10.09**	**10.82**	**15.42**
Value of gains per bu. of corn, cost of tankage and minerals deducted†	$ 1.00	$ .93	$ 1.07	$ .85	$ .92	$ 1.23‡
Returns per acre, cost of tankage and minerals deducted‡	$45.95	$48.86	$48.97	$44.70	$42.09	$64.57

*Minerals composed of ground limestone, 2; raw bone meal, 2; salt, 1. All lots had access to block salt in addition to that in the mineral mixture.

Gains $8.50 per 100 lb.; tankage $70 a ton; mineral mixture 1.6 cents per lb.; block salt 1 cent per lb.

†Based on corn yields given in Table 9 and an assumed reduction of 3 percent when containing rape.

‡Estimating the forage utilized as equivalent to ⅛ acre, a further deduction of 7 cents would cover the pasture charge at the rate of $32 an acre.

The corn and soybeans produced more rapid gains and greater gains from a given amount of feed than the corn and minerals. Minerals fed with the corn and soybeans increased the rate of gain from 1.98 to 2.16 pounds daily and lowered the feed requirement per 100 pounds of gain from 536 to 465 pounds. All of the pigs gained well but those having standing corn, soybeans, and minerals made a particularly good showing. While they lacked .24 pound per head

of gaining as much daily as those on the same feeds plus tankage, they took less feed per pound of gain. Altho the gain per acre for the pigs receiving tankage (Lot 1) was somewhat larger, the additional gain was not sufficient to pay for the cost of the tankage.

The pigs of Lot 2, getting minerals and tankage with standing corn, failed to gain as rapidly or to produce as much gain from a given amount of feed as either Lot 1 or 3, receiving corn, soybeans, minerals, and tankage; and corn, soybeans, and minerals, respectively. But, since there was a greater yield of corn in the absence of the beans, Lot 2 made 84 pounds more gain to the acre than Lot 1 and 102 pounds more than Lot 3. For the same reason Lot 4 on corn and minerals lacked only 5 pounds of making as much gain to the acre as Lot 3 on corn, soybeans, and minerals.

An interesting feature of the experiment was the amount of rooting that was done by the different lots. As will be noticed in Figure 7, the pigs of Lot 4, getting nothing but standing corn and minerals, did a great deal of rooting, especially in the more moist places of the plot. Lot 3, getting standing corn, soybeans, and minerals and Lot 5 getting standing corn and soybeans rooted some, but not nearly as much as Lot 4. Very little rooting was done by Lots 2 and 1 getting both tankage and minerals along with corn and with corn and soybeans.

TANKAGE, RAPE, AND SOYBEANS AS SUPPLEMENTS

Clarage corn and Manchu soybeans were used for a second hogging-down experiment in 1925. The corn was checked and the beans were dropped in the hills by means of a soybean attachment to the planter. As mentioned on page 316 pigeons destroyed a part of the corn just after it came up and left a thin irregular stand. Since the unevenness of the corn would have made the usual method of gathering two representative rows for estimating the yield an unreliable one, the approximate yield of each plot was determined by counting all of the ears on the plot, harvesting the corn from every tenth hill in every fifth row, finding the average weight of the ears and the percentage of moisture-free shelled corn and computing from these the yield on a 15.5 percent moisture basis.

Owing to the favorable weather and the thinness of the corn, the soybeans made a luxuriant growth. As estimated by gathering, drying, and hulling the beans from two representative rows, they also produced a fair yield of beans. Thin corn and an abundance of moisture likewise enabled the rape, which was seeded at the last cultivation, to produce an unusually large amount of forage.

The pigs used were purebred Hampshires, secured from one of the leading Hampshire breeders of the State. Previous to their purchase they had been running on a field of standing corn containing soybeans. Hence, when the experiment was started, they were in fair condition and were accustomed to the taste of soybeans. Table 16 shows the plan of feeding and gives the results of the experiment. The pigs fed the harvested corn were kept in a small temporary pen, about 50 by 30 feet in size, adjoining the corn which was hogged down. They had no green feed of any kind except what little they got along the fence row at one end of the pen.

TABLE 16.—Comparison of Tankage, Rape, and Soybeans for Supplementing Standing Corn and Minerals*

	Lot 1 Standing corn	Lot 2 Standing corn containing rape	Lot 3 Standing corn containing soybeans	Lot 4 Harvested new corn
Supplements fed	Tankage Minerals*	Minerals	Minerals	Tankage Minerals
From Oct. 7, 1925 to	Dec. 22	Dec. 14	Dec. 24	Dec. 22
Area hogged down, acres	2	2	2	.....
Number of pigs per lot	8	8	8	8
Initial weight per pig	116.62	116.73	116.06	116.83
Final weight per pig	232.81	222.12	227.75	232.19
Total gain	929.52	843.17	893.52	922.83
Average daily gain	1.53	1.55	1.43	1.52
Feed:				
Corn (15.5 % moisture)	5,048.65	4,144.43	5,554.16	4,151.61
Tankage	243.20	.....	.....	243.20
Soybeans†	.....	.....	306.13	.....
Mineral mixture	55.00	52.90	40.00	45.00
Total	5,346.85	4,197.33	5,900.29	4,439.81
Daily feed per pig:				
Corn	8.30	7.62	8.90	6.83
Tankage	.40	.....	.....	.40
Soybeans	.....	.....	.49	.....
Mineral mixture	.09	.10	.07	.07
Total	8.79	7.72	9.46	7.30
Feed per 100 lb. gain:				
Corn	543.16	491.53	621.62	449.88
Tankage	26.16	.....	.....	26.35
Soybeans	.....	.....	34.26	.....
Mineral mixture	5.92	6.28	4.48	4.88
Total	575.24	497.81	660 36	481.11
Gain per bu. of corn received	10.31	11.39	9.01	12.45
Value of gain per bu. with cost of tankage and minerals deducted	$ .77	$ .96	$ .76	$ .93
Returns per acre; cost of tankage and minerals deducted‡	$40.54	$48.73	$34.78	$49.01

Gains $8.50 per 100 lb.; tankage $70 a ton; minerals 1.6 cent a lb.

*Minerals composed of ground limestone, 2; raw bone meal, 2; salt, 1.

†Some of the soybeans were left in the field and these as well as those actually consumed are charged against the pigs.

‡Based on corn yields given in Table 9 and an assumed reduction of 3 percent when containing rape.

Unlike those reported in Table 15, soybeans grown in the corn in this trial proved less effective than tankage for supplementing standing corn and minerals. The pigs getting tankage not only gained more rapidly but also produced more gain from a given

amount of feed. Altho the pigs had had access to soybeans previous to the beginning of the experiment and were accustomed to their taste, some of the beans were left at the close of the test. The trial reported in Table 15 is the only one in the series in which the pigs took the soybeans readily and ate them all by the time the supply of corn was exhausted. The figures given in Table 16 are for the total amount of beans produced after deducting what was harvested for making an estimate of the yield.

Fig. 4.—Lot 1, Table 15, standing corn and soybeans plus tankage and minerals. The pigs on this acre plot gained 692 pounds. When tankage was fed, soybeans in the corn increased the rate of gain but reduced the corn yield to such an extent that less gain in liveweight per acre was secured

Standing corn, rape, and minerals produced more rapid gains than standing corn, soybeans, and minerals; and more gain in live weight for each bushel of corn consumed than either corn, soybeans, and minerals or corn, tankage, and minerals.

When harvested and fed with tankage and minerals each bushel of corn produced 12.45 pounds of gain in live weight, or 2.14 pounds more than was secured from the standing corn.

SOYBEANS VS. TANKAGE FOR SUPPLEMENTING STANDING CORN

Standing corn containing soybeans plus minerals, was compared with standing corn plus tankage and minerals in both of the 1925 experiments. Table 17 gives the average results secured from these two combinations.

Altho, as was demonstrated in the experiment reported in Table 15, minerals with standing corn and soybeans are beneficial, the data show the pigs getting tankage to have gained more rapidly

TABLE 17.—Summary of Experiments Comparing Soybeans, in the Corn, and Tankage for Supplementing Standing Corn and Minerals

	Standing corn containing soybeans plus minerals	Standing corn and tankage plus minerals
Number of trials	2	2
Number of pigs	16	16
Area hogged down—acres	3	3
Initial weight per pig	107.25	107.65
Final weight per pig	205.22	214.22
Total gain	1,567.52	1,705.17
Average daily gain	1.67	1.75
Feed:		
Corn	8,536.87	8,680.01
Tankage	.....	395.20
Soybeans	435.93	.....
Minerals	60.00	70.00
Salt	1.70	2.00
Total	9,034.50	9,147.21
Daily feed per pig:		
Corn	9.12	8.89
Tankage	.....	.41
Soybeans	.47	.....
Minerals	.06	.07
Salt	.002	.002
Total	9.65	9.37
Feed per 100 lb. gain:		
Corn	544.61	509.04
Tankage	.....	23.18
Soybeans	27.81	.....
Minerals	3.83	4.10
Salt	.11	.12
Total	576.36	536.44
Gain per bu. of corn received	10.28	11.00
Value of gains per bu. with cost of tankage and minerals deducted	$ .87	$ .84
Returns per acre; cost of tankage and minerals deducted*	$39.74	$44.03

Gains $8.50; tankage $70 a ton; minerals 1.6 cent a lb.
*Based on yields given in Table 9.

on the average and to have produced a larger amount of gain for each bushel of corn consumed. Based on the average results of the two experiments and the yields given in Table 9, corn, tankage, and minerals would have produced 577.6 pounds of gain in live weight, and, after deducting the cost of the tankage at $70 a ton and of the minerals at $32 a ton, resulted in a return of $44.03 an acre, when the gains were figured at $8.50 a 100 pounds. The corn, soybeans, and minerals would have produced 470.9 pounds of gain and at the same prices have resulted in a return of $39.74 an acre, after deducting the cost of the minerals.

HAMPSHIRES VS. DUROCS FOR HOGGING DOWN CORN AND SOYBEANS

To secure information as to whether one breed is more suitable than another for hogging down crops, particularly corn and soybeans, Station-grown Duroc Jerseys were compared with the Hampshires of Lot 3 in the experiment reported in Table 16. Besides the standing corn and soybeans, both groups were given access to a mineral mixture composed of ground limestone 2, raw bone meal 2, and salt 1.

The Duroc Jerseys available for the experiment averaged 16 pounds lighter in weight at the beginning of the test than the Hampshires. The two groups as named gained at the rates of 1.31 and 1.43 pounds daily a head, respectively. Five of the Duroc Jerseys, from one litter, gained 1.51 pounds daily, but the other three, which were from another litter made a gain of only a pound a day. A gain of 1.27 pounds a day was made by the poorest doing Hampshire. The Duroc Jerseys consumed 608 pounds of corn and the Hampshires 622 pounds for each 100 pounds of gain in live weight. Neither lot took all of the soybeans on their respective plots. The plot hogged down by the Duroc Jerseys contained 78.5 percent more soybeans than the other. No attempt was made to determine the quantity of beans actually eaten by each group, but the total production amounted to 66.82 pounds for each 100 pounds of gain in live weight made by the Durocs and 34.26 pounds for each 100 pounds of gain in live weight made by the Hampshires.

Fig. 5.—Lot 2, Table 15, standing corn plus tankage and minerals. The pigs on this acre plot gained 776 pounds

The two groups as named ate 3.67 and 4.48 pounds of minerals, respectively, per hundred pounds of gain. At the prices given in Table 16 the value of the gains per bushel of corn, after deducting the cost of the minerals, but without taking the soybeans into account, amounted to 73 cents in the case of the Durocs and 71 cents in the case of the Hampshires.

The one experiment, which alone should not be regarded as conclusive, indicated no significant difference in the ability of the two breeds to utilize standing corn and soybeans.

GREEN FEED WITH STANDING CORN

The value of green feed, in the form of rape and of soybean foliage, for pigs that are hogging down corn has been mentioned. In 1919 an experiment was conducted at the Miami County Experiment Farm to study the effect of giving pigs on standing corn access to clover pasture in an adjoining field. The clover was of good quality, having been seeded in the spring in rye, two-thirds of which was hogged down between July 18 and August 11, and one-third cut and threshed. The pigs used were purebred Duroc Jerseys which had been grown on the farm. Those having access to clover and those having no pasture were given one-fourth and one-third of a pound of tankage daily a head, respectively. The results of the experiment are reported in Table 18.

TABLE 18.—The Effect of Pasture on the Returns from Hogging Down

	Lot 1 Standing corn plus tankage	Lot 2 Standing corn plus tankage
Forage	None	Clover pasture
From Sept. 11, 1919 to	Oct. 17	Oct. 20
Area hogged down, acres	3	3
No. of pigs	27	27
Initial weight per pig	97.02	95.22
Final weight per pig	156.31	169.22
Total gain	1,601	1,998
Average daily gain	1.65	1.90
Feed:		
Corn (15.5% moisture)	6,425.4	6,815.6
Tankage	319.5	259.9
Corn and tankage	6,744.9	7,075.5
Daily feed per pig:		
Corn	6.61	6.47
Tankage	.33	.25
Corn and tankage	6.94	6.72
Feed per 100 lb. gain:		
Corn	401.34	341.12
Tankage	19.96	13.01
Corn and tankage	421.30	354.13
Gain per bu. of corn received	13.95	16.42
Value of gains per bu. with cost of tankage deducted*	$1.09	$1.32

*Gains $8.50 per 100 lb.; tankage $70 a ton.

Besides increasing the rate of gain .25 pound daily a head, the clover pasture enabled the pigs to gain 2.47 pounds more in live weight for each bushel of corn consumed. The tankage consumption per bushel of corn was 2.14 pounds for the lot getting clover and 2.78 pounds for the lot receiving no green feed.

In 1923 a second experiment to compare standing corn and tankage with standing corn and tankage plus pasture in an adjoining field was conducted at the Miami County Experiment Farm. Duroc Jersey pigs from the herd on the farm were used in the test.

The pasture was originally a mixture of clovers and timothy. It had been grazed by hogs thruout the summer and was of rather poor quality and largely timothy when utilized for the experiment. Tankage was fed at the rate of .4 pound daily a head to the pigs getting no pasture and at the rate of .25 pound daily to those having access to pasture. The results of the test are given in Table 19.

TABLE 19.—The Effect of Pasture on the Returns from Hogging Down

	Lot 1 Standing corn plus tankage	Lot 2 Standing corn plus tankage
Forage	None	Timothy and clover
From Sept. 19, 1923 to	Oct. 13	Oct. 13
Area hogged down, acres	1.5	1.5
No. of pigs	21	21
Initial weight per pig	108.38	108.45
Final weight per pig	154.33	158.67
Total gain	965.0	1,054.5
Average daily gain	1.91	2.09
Feed:		
Corn (15.5 % moisture)	3,556	3,727
Tankage	204	126
Corn and tankage	3,760	3,853
Daily feed per pig:		
Corn	7.06	7.40
Tankage	.40	.25
Corn and tankage	7.46	7.65
Feed per 100 lb. gain:		
Corn	368.50	353.47
Tankage	21.14	11.95
Corn and tankage	389.64	365.42
Gain per bu. of corn received	15.20	15.84
Value of gains per bu. with cost of tankage deducted*	$1.18	$1.28

*Gains $8.50 per 100 lb.; tankage $70 a ton.

Despite the poor quality of the pasture it slightly increased the rate of gain as well as the gain produced from a given amount of feed. With the gains in live weight valued at $8.50 a 100 pounds and with the cost of the tankage at $70 a ton deducted, the gross returns per bushel of corn were $1.09 for the pigs having no green feed and $1.32 for those having access to pasture.

Methods of providing green feed.—Supplying pigs in some manner with an abundance of green feed while they are hogging down corn is unquestionably highly beneficial. There are several methods of doing this. Soybeans seeded with the corn furnish green feed early in the season, particularly if they are a late maturing variety; but, on account of the leaves dropping off soon after the first hard frost, they fail to provide forage thruout the fall. Rye may be drilled in the corn after the last cultivation; but it is more costly to seed than either soybeans or rape because of the greater amount of labor involved and the larger amount of seed

required. When rye is seeded early in order that it may have an opportunity to make sufficient growth for pasturing by the time the corn is ready to hog down, failure to secure a stand is sometimes experienced.

Fig. 6.—Lot 3, Table 15, standing corn and soybeans plus minerals. The pigs on this acre plot gained 674 pounds, or, on the basis of an equivalent yield, 98 pounds more than those having the same ration without minerals

Another plan of supplying green feed with standing corn is to seed rape in the corn at the time of the last cultivation. An objection to this is that if the season be dry the rape thus seeded will produce little or no growth, and will provide practically no forage. To overcome the uncertainty of the crop, Professor J. M. Evvard of the Iowa Experiment Station has tried seeding the rape with the corn at corn planting time. Possibly an even better plan would be to seed the ends of the rows or a strip at one side of the field to rape at corn planting time or shortly after.

Still another plan for providing pigs on standing corn with green feed is to arrange the field of corn to be hogged down, as was done in the experiments reported in Tables 18 and 19, so that it will adjoin a pasture field, preferably of alfalfa or clover.

HOGGING DOWN COMPARED WITH HARVESTING AND FEEDING

Whether corn is hogged down or harvested and fed, the returns from feeding it, as compared with those from marketing it as grain, will depend on the relative prices of corn and hogs. For this reason, in order to determine whether hogging down is an economical practice, it is necessary to compare the returns from hogs on standing corn with those from similar hogs fed harvested corn.

In comparisons of hogging down with harvesting and feeding four possibilities are presented even when the protein and mineral supplements are the same: First, the pigs on standing corn might have forage or green feed of some kind whereas if the corn were harvested and fed, particularly during the winter, no green feed would be provided. Second, no green feed would be supplied in either case. Third, forage would be furnished regardless of whether the pigs were allowed standing or harvested corn. Fourth, if the corn were hogged down the pigs might have no forage, while if it were harvested and fed they would be allowed to run on pasture of some kind.

Fig. 7.—Lot 4, Table 15, standing corn plus minerals. The pigs on this acre plot gained 669 pounds. The large amount of rooting done and the less efficient gains were evidence that minerals did not adequately balance the corn

In practice the time of feeding the harvested corn is a factor in determining whether green feed can be supplied. If the corn is harvested and fed to the pigs that would otherwise be used for hogging it down, there should be no difficulty in providing them with green feed. If it is harvested and fed to fall pigs during the winter no pasture would be available. A compensating factor, however, would be the higher price of hogs in April and May than in November and December (see Fig. 3). In case the harvested corn is carried over and fed the following summer pasture could easily be provided.

Wooster experiments.—Table 20 gives a summary of the Wooster experiments comparing hogging down with harvesting and feeding. The results of the individual experiments are reported in the preceding tables.

TABLE 20.—Comparisons of Hogging Down With Harvesting and Feeding Corn. Summary of Wooster Experiments

	I		II		III		IV	
	Standing corn and tankage	Harvested corn and tankage	Standing corn and tankage	Harvested corn and tankage	Standing corn and tankage	Harvested corn and tankage	Standing corn and tankage	Harvested corn and tankage
	Forage	No forage	No forage	No forage	Forage	Forage	No forage	Forage
Number of trials	2	2	3	3	1	1	3	3
Total number of pigs	12	12	20	20	6	6	26	26
Initial weight per pig	157.62	157.67	140.65	141.33	126.67	127.83	109.11	112.89
Final weight per pig	209.33	213.67	218.3	221.07	211.25	205.25	175.13	185.25
Average daily gain	**1.81**	**1.90**	**1.61**	**1.66**	**1.97**	**2.04**	**1.93**	**2.19**
Feed:								
Corn	2,865.38	2,870.48	7,967.39	7,022.09	2,035.76	1,640.98	7,210.48	6,458.02
Tankage	102.60	141.60	384.80	384.80	77.40	68.40	360.80	283.60
Corn and tankage	2,967.98	3,012.08	8,352.19	7,406.89	2,113.16	1,709.38	7,571.28	6.741.62
Daily feed per pig:								
Corn	8.38	8.11	8.28	7.30	7.89	7.20	8.10	7.51
Tankage	.30	.40	.40	.40	.30	.30	.41	.33
Corn and tankage	8.68	8.51	8.68	7.70	8.19	7.50	8.51	7.84
Feed per 100 lb. gain:								
Corn	461.79	427.16	513.03	440.30	401.14	353.28	420.03	343.28
Tankage	16.53	21.07	24.78	24.13	15.25	14.73	21.02	15.08
Corn and tankage	478.32	448.23	537.81	464.43	416.39	368.01	441.05	358.36
Gain per bu. corn	12.13	13.11	10 92	12.72	13.96	15.85	13.33	16.31
Tankage per bu. corn	2.01	2.76	2.70	3.07	2.13	2.33	2.80	2.46
Value of gains per bu. with cost of tankage deducted*	$ .96	$ 1.02	$ .83	$ .97	$ 1.11	$ 1.26	$1.03	$ 1.30
Difference	.....	$+.06	.....	$+.14	.....	$+.15	.....	$+.27

*Gains $8.50 per 100 lb.; tankage $70 a ton.

While the differences were not great, the pigs fed harvested corn made slightly more rapid gains on the average than those getting standing corn. Without exception harvested corn produced greater gains from a given amount of feed. The averages ranged from .98 to 2.98 pounds more gain in live weight for each bushel of corn received. With the gains valued at $8.50 a 100 pounds and with the cost of the tankage at $70 a ton deducted, the gross returns ranged from 6 cents to 27 cents more per bushel for the harvested corn than for the corn that was hogged down. When no forage was supplied in either case there was an average difference of 14 cents a bushel in favor of the harvested corn. In the one trial in which green feed was provided for both groups of pigs those getting harvested corn returned 15 cents more per bushel for the corn than those on the standing corn. From these figures it would be necessary to deduct the cost of harvesting and feeding the corn.

Miami County Experiments.—A number of experiments comparing hogging down with harvesting and feeding were also conducted at the Miami County Experiment Farm. These are summarized in Table 21.

TABLE 21.—Hogging Down Compared With Harvesting and Feeding. Summary of Experiments Conducted at the Miami County Experiment Farm

	III		IV	
	Standing corn and tankage	Harvested corn and tankage	Standing corn and tankage	Harvested corn and tankage
	Forage	Forage	No forage	Forage
Number of trials	3	3	3	3
Total number of pigs	105	105	73	73
Initial weight per pig	133.43	130.39	167.91	167.35
Final weight per pig	195.45	200.93	216.53	226.58
Total gain	6,512.0	7,406.8	3,549.0	4,323.5
Average daily gain	1.96	2.23	1.76	2.14
Feed:				
Corn (15.5 pct. moisture)	28,907.82	27,177.94	20,674.58	17,722.93
Tankage	818.00	1,063.93	660.00	662.17
Corn and tankage	29,725.82	28,241.87	21,334.58	18,385.10
Daily feed per pig:				
Corn	8.72	8.20	10.24	8.78
Tankage	.25	.32	.33	.33
Corn and tankage	8.97	8.52	10.57	9.11
Feed per 100 lb. gain:				
Corn	443.92	366.93	582.54	409.92
Tankage	12.56	14.37	18.60	15.32
Corn and tankage	456.48	381.30	601.14	425.24
Gain per bu. of corn received	12.61	15.26	9.61	13.66
Tankage consumed per bu. of corn	1.58	2.19	1.79	2.09
Value of gains per bu. with cost of tankage deducted*	$1.02	$1.22	$.76	$1.09
Difference	.....	$ .20	.....	$ .33

*Gains $8.50 per 100 lb.; tankage $70 a ton.

In three of the Miami County tests green feed was provided for both groups of pigs. In the other three the pigs in the corn field had no forage, but those fed the harvested corn were kept on pasture. The average results in both cases were similar to those of the Wooster experiments except that the differences in favor of harvesting and feeding were 4 and 6 cents greater, respectively.

Harvesting and feeding sometimes most economical.—Tests comparing hogging down with harvesting and feeding have also been conducted at several other stations. The results of these are not all in accord with those herein reported. In the seven Ohio experiments, in which the other feeds were the same, the average returns from harvested corn, as reported in Tables 20 and 21, were from 14 to 20 cents greater a bushel than those from standing corn. In five of the experiments at other stations the returns ranged from 11 to 26 cents more a bushel for harvested corn than for standing corn; in two, 1 and 5 cents more, respectively; and in two, 7 and 14 cents less. The cost of harvesting and feeding corn will vary under different conditions, but with usual prices will seldom exceed 10 cents a bushel. A majority of the experiments reported so far indicate that, contrary to the opinion often held, hogging down corn is frequently not an economical practice.

Fig. 8.—Lot 5, Table 15, standing corn and soybeans. The pigs on this acre plot gained 553 pounds. Altho a more effective supplement than minerals alone soybeans resulted in less gain per acre, because of their reduction in the yield of corn

The differences in results cannot be definitely accounted for; but, since more corn is likely to be tramped into the ground and wasted when it is muddy than when it is dry, weather conditions probably materially affect the relative returns from hogging down and from harvesting and feeding.

FACTORS ADVERSE TO HOGGING DOWN

The saving in labor has been mentioned as the chief advantage of hogging down. Among the disadvantages may be listed the necessity of marketing the crop thru hogs at a time of year when hogs are usually low in price. Whether this is of significance to the individual farmer will depend largely on the system of production followed. By proper care and heavy feeding from birth early spring pigs may be prepared for market ahead of the general run and before the price has declined materially. Such pigs can make use of very little new corn but must be fed largely on corn that has been held 9 or 10 months longer than would have been necessary had it been fed to pigs farrowed the preceding spring. On the other hand early spring pigs make early fall pigs possible and this enables them to get a good start before cold weather sets in and permits their being finished for the March or April market when the price is usually higher than it is the latter part of May or during June.

Fig. 9.—Lot 6, Table 15, harvested new corn plus tankage and minerals. Pigs on rape and sweet clover pasture. Not taking the 7 weeks' pasture charge into account these pigs returned 30 cents a bushel more for corn than those of Lot 3

SUMMARY

Early hogging is favored by the decline in the market value of hogs as the season advances and by the high price of old corn. On the other hand, because of a rapid increase in the dry matter of corn during the last few weeks of growth, hogging down immature corn means a sacrifice in the gain in live weight to be secured per acre. One trial indicated the solids of green or sappy corn to have no higher feeding value than those of mature corn.

Altho early corn matures sufficiently to permit earlier hogging; what is gained in this way is partially or wholly offset by the smaller yield and the consequent smaller increase in live weight per acre.

When tankage or similar feeds were given, ten pigs, averaging 75 to 100 pounds in weight when turned on the corn, ate about a bushel of corn a day, or harvested an acre in approximately as many days as it yielded bushels.

In experiments comparing the yields of corn and soybeans with those of corn alone, soybeans reduced the yield of corn, without exception. Whenever the corn was planted in hills the combination crop yielded slightly less on the average than the corn alone. When the corn was drilled the yields of corn and soybeans, grown together, were lower in some instances and higher in others than those of corn alone, but on the whole they were not greatly different.

Soybeans grown in the corn were less effective than tankage for supplementing standing corn.

Feeding tankage along with standing corn and soybeans materially increased the rate of growth as well as the gain in live weight from a given amount of feed.

Pigs on standing corn, soybeans, and tankage made greater gains per bushel of corn received than those on standing corn and tankage, but gave smaller returns per acre, because of the lower yield of the corn.

Minerals and standing corn, in the one experiment in which they were tried, produced slower gains and slightly less gain per bushel of corn but more gain per acre than soybeans and corn.

The combination of standing corn and soybeans was improved by the addition of minerals.

Pigs on standing corn, tankage, and minerals did not gain as rapidly or make quite as much gain from a given amount of feed as

those on corn, soybeans, tankage, and minerals. But since the corn alone yielded more than that containing a companion crop of soybeans, the returns per acre were in their favor.

A summary of two trials shows standing corn plus tankage and minerals to have resulted in faster gains, greater gains from a given amount of feed, and larger returns per acre than standing corn and soybeans plus minerals.

When used as the only supplement, rape, seeded in the corn after the last cultivation, proved more valuable than soybeans, seeded at the time the corn was planted.

Standing corn, rape, and tankage gave more rapid growth but slightly smaller gains per bushel of corn consumed than standing corn, soybeans, and tankage. In a single test when the season was favorable, rape with standing corn and minerals produced more rapid gains, greater gains from a given amount of feed, and a larger return per acre than soybeans with the same feeds.

An objection to rape, seeded at the time of the last cutivation, is that it produces little or no growth if the season is dry. Perhaps seeding a strip at the end or side of the corn to rape at the time the corn is planted would be a more dependable plan.

Pigs fed standing corn and tankage and given access to clover pasture in an adjoining field made cheaper and more rapid gains than similar pigs similarly fed but having no green feed.

Harvesting and feeding frequently yields a greater profit than hogging down. The experiments herein reported consistently gave a larger return per bushel for corn that was harvested and fed than for corn that was hogged down. Usually the difference was more than sufficient to pay for the additional cost involved under normal conditions.

The chief advantage of hogging down is the labor it saves; the chief disadvantage is the necessity of marketing the corn thru hogs at a time of year when their price is usually low.